

TITLE: EVALUATION OF FILTER PAPER AS A MEANS TO TRANSPORT INACTIVATED GRAM NEGATIVE NON-FERMENTATIVE BACTERIA AND FASTIDIOUS MICROORGANISMS FOR IDENTIFICATION USING THE MALDI-TOF MS SYSTEM

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ABSTRACT

Gram negative non-fermentative (GNNF) bacteria and fastidious microorganisms represent a challenge for identification using conventional phenotypic methods in clinical microbiology laboratories. The use of the Matrix-Assisted Laser Desorption Ionization-Time of Flight Mass Spectrometry (MALDI-TOF/MS) technology has allowed a reliable identification of GNNF and fastidious bacteria. In order to have access to the MALDI-TOF/MS technology, microbiology laboratories with low resources usually send the isolates to laboratories which offer identification using MALDI-TOF/MS. Transportation of bacteria may present biological risks and it is important to develop alternatives to minimize these risks. This study aimed to evaluate the filter paper as a means to transport inactivated GNNF bacteria and fastidious microorganisms for analysis using the MALDI TOF MS technology. A total of 133 isolates were evaluated and the analysis of each isolate was performed directly from original bacterial colony in solid media and in filter paper after the procedure of inactivation; impregnation and extraction. To evaluate the agreement between the identification performed directly from the colony and after impregnation in filter paper, we assign the scores: > 2.3 as excellent (E); 2.0 to 2.3 as very good (VG); 1.7 to 1.99 as good (G); <1.7 as unidentified (U). The divergences were classified as: Minor Divergence (the classification varied from E to VG and VG to G); Media Divergence (the classification varied from E to B); and Major Divergence (the classification varied from E, VG or G to unidentified or did not obtain detectable peaks). A total of 80 (68.9%) isolates transported in the filter paper disks presented full category concordance; 39 isolates presented Minor Divergence; 4 isolates present Media Divergence; 4 isolates present Major Divergence and 6 isolates present better results only after impregnation in filter paper. The proposed methodology of bacteria transportation presented a sensitivity of 96.9% and a specificity of 100%. The filter paper as a means to transport and storage of inactivated GNNF and fastidious bacteria may be considered a potential tool for faster, more accurate, biosafe and less-expensive identification.

Keywords: FASTIDIOUS MICROORGANISMS; FILTER PAPER; GRAM NEGATIVE NON-FERMENTATIVE BACTERIA; MALDI-TOF MS

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